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B P I S A E

RESEARCH ACTIVITIES

PLEASE CIRCULATE TO ALL INTERESTED EMPLOYEES OF THE BUREAU

PLANT INDUSTRY STATION, BELTSVILLE, MD.

FEBRUARY 1951

FOR ADMINISTRATIVE USE ONLY

To employees of the
Bureau of Plant Industry, Soils,
and Agricultural Engineering

Here are the major points in the President's budget estimates for this Bureau for the fiscal year 1952, which we are presenting before the Congressional subcommittee on appropriations.

The budget estimates propose to consolidate 5 subappropriation items--field crops; fruit, vegetable, and specialty crops; forest diseases; soils, fertilizers, and irrigation; and agricultural engineering--into a new single subappropriation item--plant, soil, and agricultural engineering research. The sixth item--the National Arboretum--will be retained without change. The consolidation of the 5 items is designed solely to simplify the appropriation structure and administration of the Bureau. It will not affect the nature or scope of the research work.

A summary of the 1952 estimates compared with current funds show:

	Total estimated available 1951 <u>a/</u>	Budget estimates 1952	Increase or decrease
Salaries and expenses			
1. Plant, soil, and agricultural engineering research	10,695,350	10,636,400	-58,950
2. National Arboretum	148,650	148,600	-50
Total.....	10,844,000	10,785,000	-59,000

	Total estimated available 1951 <u>a/</u>	Budget estimates 1952	Increase or decrease
Allotments, transfers, and other funds:			
1. Research and Marketing Act of 1946 (Title II)	361,000	321,000	-40,000
2. Research on strategic and critical agricul- tural materials	239,000	382,900	+43,900
3. Expenses, international development, executive office of the President (for hevea rubber pro- duction in the Western Hemisphere)	211,500 <u>b/</u>		
4. Advanced from Atomic Energy Commission (for soil management and crop production through in- vestigations with radio- active isotopes)	203,995	<u>c/</u>	
5. General Services Adminis- tration (for stockpiling guayule rubber seeds and providing tech- nical services for stockpiling guayule seedlings)	162,000 <u>d/</u>	<u>c/</u>	
6. Other funds	280,983	<u>c/</u>	
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Total allotments.....	1,458,478		

a/ Adjusted for comparability with the appropriation structure proposed in the 1952 budget estimates. The salaries and expenses appropriation includes funds formerly received under allotments from the Research and Marketing Act, sections 10a and 10b; special research fund; Soil Conservation Service; Farm Housing; and National Institutes of Health.

b/ Allotment as of December 31, 1950.

c/ Allotments for 1952 have not been determined.

d/ Tentative allotment.

Increases and decreases under our salaries and expenses appropriation in the budget for 1952 are as follows:

Plant, Soil, and Agricultural Engineering Research:

To develop wheat varieties resistant to new races of stem rust...	+ \$28,900
To develop practical methods for controlling oak wilt.....	+ 35,000
For operation of research program at Brawley, Calif.....	+ 85,000
Elimination of non-recurring items of \$85,000 provided in 1951 Appropriation Act and \$100,000 provided in Supplemental Appropriation Act, 1951, for completion of buildings and facilities at the Brawley field station.....	-185,000
Decrease resulting from a direct appropriation to the General Services Administration for certain procure- ment and leasing costs previously paid from this subappropriation.....	-22,850
Subtotal.....	-58,950

National Arboretum

Decrease resulting from a direct appropriation to General Services Administration for certain procurement costs previously paid from this subappropriation.....	-50
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The final amounts available for 1952 will not be known, of course, until the appropriations have been passed by Congress and allotments and transfers have been made.

Sincerely yours,

Robert M. Salter

Chief of Bureau

Annual Report Off the Press

About 70 new varieties of grains, fruits, vegetables, and other plants recently introduced and released by the Bureau and cooperating State experiment stations are listed in the 1949-1950 annual report of the Chief of the Bureau.

Evidence is presented to show that sustained research may be setting the stage for another upsurge in crop improvement and food production efficiency in a period when it may be badly needed. The build-up of research techniques and data in past years is now making possible shifts necessary to meet new conditions.

Wide-row Spacing for Corn-Wheat Sequence

Exploring problems that attend a corn-wheat sequence on eastern farms, G. H. Stringfield (CC&D) and L. E. Thatcher of the Ohio station suggest that corn row spaces of 60 or even 70 inches will permit use of full-season hybrid corn, mechanical harvesting after it is ripe, the sowing of wheat with reasonably efficient tools at an optimum date, and the seeding of meadow crops successfully in corn.

The corn-wheat sequence offers a number of advantages. It provides corn for feed, wheat for cash, bedding, and a companion crop for forage. But it does not lend itself to mechanization. If a full-season corn hybrid is planted in the usual 40-inch rows and allowed to stand until dry enough for storage, it will not be ready for mechanical harvest before October, a month late for seeding wheat. To get around this, the farmer may plant an early hybrid, in order to harvest early with a mechanical harvester, and be penalized by lower yields. In any case he is likely to harvest the corn before it is dry and then sow the wheat from a week to a month later.

In experiments using different widths of corn-row spaces, Mr. Stringfield and Mr. Thatcher found that where soil and season produce less than 30 bushels to the acre, yields drop gradually as row spaces are wider than 30 inches, the rate being about 1 bushel loss for each 4 inches of wider row space. But where soil and season produce 70 to 100 bushels per acre, there is no perceptible loss when rows are widened to 50 inches, about a 4-bushel loss at the 60-inch row space, and approximately 9 bushels loss at the 70-inch space.

The Ohio study indicates that on good land and during a favorable season, a full-season hybrid in 60-inch row spaces would yield fully as much as an early hybrid in 40-inch spaced rows. The 60-inch spacing would permit the seeding of wheat at the optimum date between the standing rows of unharvested corn and picking the corn with a mechanical harvester when it is fully ready

Cereal Belt Leads in Herbicides

More than $1\frac{1}{2}$ million pounds of 2,4-D or 2,4,5-T were used in 1950 by growers in 14 States and 3 Canadian Provinces, reports L. M. Stahler (WI). The area includes Michigan, Wisconsin, Illinois, Iowa, Minnesota, Nebraska, Missouri, North Dakota, South Dakota, Kansas, Oklahoma, Texas, Manitoba, Alberta, and Saskatchewan.

In Texas the chemicals were applied by plane on 385,000 of the half-million acres treated. Ground equipment was used almost exclusively--on 99 percent-- of the 14 million acres covered in Canada.

Mr. Stahler estimates that more than half of the North American output of the two herbicides was used in the area covered by the North Central Weed Control Conference.

Foundation Seed Project Expanded

Narragansett alfalfa and Midland clover were added to the Foundation Seed Project at a meeting of the planning section of the National Advisory Committee in Chicago in January. This increases the number of improved varieties in the program to 8, including 3 other alfalfas - Atlantic, Buffalo, and Ranger - Kenland red clover, Tift Sudan grass, and Climax lespedeza.

The Project has been expanded to include the maintenance of adequate breeder seed for each of these varieties and to have limited responsibility for maintaining stocks of registered seed, particularly in the early years of increase. Registered seed of Narragansett alfalfa will be produced under the Project.

A measure of what has been accomplished since the Project was begun two years ago can be seen in the rapid increase of Kenland clover seed. C. G. Garrison, executive secretary of the Committee, reports that about a hundred pounds of breeder seed has been built up to nearly 100 thousand pounds of foundation seed. At least another 100 thousand pounds will be harvested from the original plantings. The foundation seed grown in 1950 will provide about 12 million pounds of seed adapted to the red clover region in the Eastern United States south of Highway 40.

Prize-winning Selections

All-America Selections, an industry-operated trial of new varieties, has recently announced to the seed trade the award of gold medals for Salad Bowl lettuce originated by Ross C. Thompson (F&VC&D) and an unnamed snap bean (No. 1515) originated at the Regional Vegetable Breeding Laboratory, Charleston, S.C. The awards, based on 1950 performance, will be announced to the general public in January 1952 or as soon as the industry increases the seed to meet consumer demands.

Salad Bowl is a tender, fairly long-standing, productive leaf lettuce with distinctly lobed leaves. Although tender and of high quality the leaves are pliable rather than crisp. This makes them suitable for pre-packaging with little or no injury. Market trials indicate that the new lettuce has a high potential as a prepacked commodity.

The snap bean is widely adapted, resistant to common bean mosaic, a variant strain of this virus, and powdery mildew. It has long, dark green pods, borne well off the ground and like other varieties released by the Bureau is highly productive and of top quality. Topcrop, a snap bean developed by W. J. Zaunmeyer at Beltsville and Greeley, Colo., was a Gold Medal winner last year.

Tomatoes Hybridized by Time-Saving Method

A technique for obtaining F_1 hybrid tomato seed without emasculating flowers in the seed-bearing parent has been devised by W. S. Porte (F&VC&D). The method reduces labor substantially by eliminating the work required to emasculate flowers and--in these studies--produced more seed per flower.

Key factors are: (1) a pollen parent that carries an easily recognizable "marker" character that will show up in the seedling of the hybrid; and (2) pollination when the flowers are from one-fourth to three-fourths open.

Mr. Porte used an inbred double-recessive dwarf potato-leaf tomato as the seed-bearing parent. Previous research had demonstrated that this line produces standard type seedlings when the pollen parent is a true breeding standard line. Selfing results in dwarf potato-leaf seedlings. This makes it easy to detect hybrid seedlings within a week or 10 days after they emerge.

Pan America and Rutgers were used as the pollen parents in these experiments.

New Lands Need Fertilizer

The Columbia River Basin with an estimated million acres of irrigable land will have large requirements for high-analysis fertilizers, particularly nitrogen, points out H. P. Singleton (SM&I).

Fertilizer studies conducted jointly with the State Agricultural Experiment Station at Prosser, Wash., show that at present prices it will pay farmers to apply nitrogen at the rate of 160 pounds per acre to corn, and at 120 pounds to potatoes. Other non-legume crops also have relatively high nitrogen requirements and even though alfalfa and hairy vetch fix large quantities of nitrogen in the soil, non-legume cash crops following them still require additional fertilizer for maximum yields.

On Ephrata loam sand at the Umatilla field station, phosphate has given increased yields of alfalfa and of potatoes in 1946 but not in 1947. Although other crops show no yield response to applied phosphate, it is possible the supply of available phosphate may soon be depleted by intensive cropping with alfalfa and sugar beets.

Plant analyses indicate that the supply of potash in these virgin soils is high. Sulfur, either elemental or gypsum, has increased yields of alfalfa and hairy vetch at the Umatilla field station. Minor element deficiencies, showing up in some areas, are under study.

Phosphorus Research Charted

A concise picture of phosphorus research by State and Federal (USDA, Interior, TVA) agencies has been drawn up in "Summary of Phosphorus Research in the United States Relating to Soils and Fertilizers." This multilithed bulletin of 114 pages was prepared by a work group of whom L. A. Dean of this Bureau is a member. It has been issued by the National Soil and Fertilizer Committee. The bulletin carries a bibliography of 673 important research contributions published in the past 15 years.

Progress With Peanuts

J. H. Beattie (F&VC&D) reports gratifying progress in tests of peanut seed stocks intended for use as foundation material for a commercial peanut seed industry.

In regional variety tests Spanish strains No. 146, No. 205, P.I. 121,070, and Improved Spanish 2-B, Runner strains - Florida 230-118 and Dixie Runner, Virginia strains - Holland Station Runner, Virginia Bunch 46-1, P.I. No. 149,645, and No. 124, 681 have shown superior yield and uniformity. The strains of the Virginia type have a high proportion of extra large kernels. All types are suitable for the uses of peanut butter manufacturers, salters, and confectioners. This work has provided a sound basis for a greatly needed commercial peanut seed industry. At present the major portion of the crop is grown from ordinary commercial stocks supplied by local shellers. High grade seed assures substantial and profitable increases.

Rapid drying of green peanuts reduces quality and results in skinned and broken kernels during shelling and handling. These losses may go up to 50 percent and the remaining product is of low quality. Laboratory results at Plant Industry Station show that shelling at higher moisture levels reduces skinning and breakage.

Good Management Is Everybody's Job

You can help improve Bureau management by three ways: calling attention to problems in your own field of work where new techniques and procedures will increase efficiency; suggesting new methods of conducting research and business operations to make better use of manpower, equipment, and space; and reporting any recent innovations along these lines--by you or your associates--that deserve wide recognition.

Send the information to Earl D. Sharer (Adm.) As organization and methods examiner, Mr. Sharer is responsible for continuing study of ways and means to improve Bureau business operations. He is particularly interested in gains that may be included in the annual statement on management improvement now required by the Bureau of the Budget. Among advances listed in the most recent statement was a technique that reduced the cost of inoculating sugar sorghum in tests for disease resistance. Another was a workable plan for consolidating subappropriation items at field stations where more than one research division conducts work. Still another gain came through the expansion of Soil Survey cartographic work to make complete separations rather than having these done by commercial lithographers. This change has already resulted in savings of more than one-third of the costs of printing the reports.

About the List of Publications

In view of the fact that a weekly mimeographed list of all articles approved for publication in scientific and other journals is available from ARA, the list formerly carried in RESEARCH ACTIVITIES is being discontinued. If you wish to receive the weekly ARA list, notify John Schubert, BPISAE Information.

Citation to McCall

At its 32nd annual meeting in Kansas City, Mo., Dec. 6, the International Crop Improvement Association honored Max A. McCall, assistant chief, for outstanding service. The award cited his "wisdom and effort in drafting Federal Seed Act of 1939, guidance in development of minimum seed certification standards, encouragement on interstate seed certification, organization of the Foundation Seed Project for small-seeded forage crops, and for inspirational leadership that has promoted cooperative working relations among the groups concerned with crop improvement."

Medal to Emsweller

Skill in hybridization and propagation of hardy woody plants has earned another medal for Samuel L. Emsweller (F&VC&D). This one is the Jackson Dawson medal awarded by the Massachusetts Horticultural Society. The letter from the Board of Trustees informing him of the award states the honor is in recognition of his important scientific contributions to the field of commercial floriculture and the nursery industry. The Gladioli Society of America recently presented Dr. Emsweller with a gold medal for advances in gladioli research.

Steiner in Brazil

At the request of Director C. A. Krug of the Instituto Agronomico, Campinas, Sao Paulo, Gotthold Steiner is spending four months in Brazil to assist in setting up a laboratory and working program for the study of plant nematodes. He will also make a general survey of nematodes prevalent in Sao Paulo and assist in training Instituto personnel to carry on the work. A.L. Taylor is in charge of the Division during Dr. Steiner's absence.

Retirements

Charles F. Kinman (F&VC&D) retired Dec. 31 after more than 41 years of service, 9 of which were at the Puerto Rico Experiment Station. Most of his investigations had to do with the propagation and production of oranges, lemons, olives, plums, and prunes. In recent years he has served as advisor and consultant on fruit problems. He has handled voluminous correspondence on fruit production from all parts of the United States and many foreign countries.

Born in Pike county, Illinois, Mr. Kinman is a graduate of Kansas State College. He is the author of many publications on the growing of various fruits and vegetables, including a number on special fruit and vegetable problems in Puerto Rico. Mr. & Mrs. Kinman plant to continue making their home in College Park, Md.

